DIRECTED POSITIVE IMAGERY AS REINFORCEMENT OF ACADEMIC BEHAVIOR IN TRAINABLE MENTALLY HANDICAPPED STUDENTS

BY

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"To imagine is to touch true reality."

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Abstract of Dissertation Presented to the Graduate School
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DIRECTED POSITIVE IMAGERY AS REINFORCEMENT OF ACADEMIC BEHAVIOR IN TRAINABLE MENTALLY HANDICAPPED STUDENTS

By

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The purpose of this study was to determine the efficacy of employing covert positive reinforcement with trainable mentally handicapped students as a means to increase speed and accuracy on a numeral naming task. Whether the enhancement of covert positive reinforcers has an effect upon the speed and accuracy of the same task was also investigated.

The pretest and posttest results of the control group (N = 14), receiving no imagery treatment, were compared to the testing results of an enhanced imagery treatment group (N = 13) and a nonenhanced imagery treatment group (N = 16). No significant results were found among the three groups. However, there was a significant increase of number correct on the numeral naming task from pretest to posttest within the nonenhanced imagery treatment group.

The results of this study do not fully support the facilitative advantages of using covert positive reinforcement with trainable mentally handicapped students as a means to positively change the academic behavior of numeral naming. Enhanced imagery treatment was not found to be superior to nonenhanced imagery treatment in this experiment.

CHAPTER I

INTRODUCTION

The purpose of this research study was to ascertain whether a conditioning procedure using directed positive imagery can be effectively employed with trainable mentally handicapped (T.M.H.) students to increase speed and accuracy on an academic task (numeral naming). The question of whether the enhancement of covert positive reinforcers (reinforcing images) has a significant effect upon the speed and accuracy of the same task was also investigated.

Current emphasis on teaching T.M.H. persons academic skills required for adaptive social mainstreaming and job employment in the community suggests a need for additional teaching strategies. Directed positive imagery may be a useful, inexpensive tool in the repertoire of such strategies.

Definitions of Imagery

Richardson (1983) presents an operational definition of mental imagery that encompasses many types of imaginal experience. He states that "mental imagery refers to (1) all those quasi-sensory or quasi-perceptual experiences of which (2) we are self-consciously aware and which (3) exist for us in the absence of those stimulus conditions that are known to produce their genuine sensory or perceptual counterparts . . ." (p. 15). He goes on to note that there is ". . . increasing evidence that self-initiated thought imagery of a concrete sensorylike kind . . . can have consequences that appear to be indistinguishable from their genuine counterparts" (p. 15). Forisha (1983) discusses imagery as representations of schematic-like sensory impressions and suggests that all sense modalities are included.

Imagery is frequently defined by way of categorizing different types or levels. McKellar (1957, 1972) distinguishes between voluntary and involuntary images, memory images, pictorial images, and verbal images (Lindauer, 1983). Piaget and Inhelder (1969), similarly, define and discuss categories of mental imagery that involve movement versus nonmovement ("anticipatory" and "reproductive" images, respectively). They suggest that the emergence of different imaging abilities is mostly a function of progressive cognitive development.

Bugelski (1983) describes mental images in terms of conditioned responses. This assumption connotes that mental imagery can be characterized from a viewpoint of neural activity not unlike the neural processes that involve stimulation of the sense organs. Bugelski goes on to suggest that since images are responses, they also generate stimuli and can facilitate overt responses (i.e. salivation, sexual arousal, etc.) and/or other imaginal experience.

The presenting study employs "directed positive imagery" which is a process in which a subject is verbally guided to imagine pleasurable mental sensations (visual, auditory, tactile, etc.), (Edenfield, 1979; Lazarus, 1977). These directed imaginings can vary in elaboration or "enhancement" according to the amount of detail presented by the experimenter or therapist.

Rationale for the Study

The employment of mental imagery techniques to therapeutically modify human behavior has occurred since the latter part of the nineteenth century. Freud, Janet, and Jung, among others, used imagery procedures with clients exhibiting an array of psychopathological symptomatology (Sheikh & Jordan, 1983). Thinkers on education, including William James (1899), alluded to the importance of imagery in learning. Although some psychotherapists eventually abandoned such techniques (e.g. Sigmund Freud), the utilization of images in the clinical setting by European investigators flourished, resulting in the developments of muscular relaxation training (Happich, 1932) and guided fantasy (Desoille, 1965; Frétigny & Virel, 1968; Leuner, 1977).

The study of imagery investigation in the United States was slower than in Europe due to the popularity of behaviorism. Watson (1925) and his followers rejected the exploration of imagery as a fruitful course of research. However, investigations of imagery were renewed after about 1960 with the advent of important work in the areas of neuropsychology, sleep, sensory deprivation, and humanistic psychology in America (Sheikh & Jordan, 1983).

One area of contemporary imagery research that has yielded impressive therapeutic results in psychotherapy and education is "covert reinforcement" as developed and formalized by Joseph Cautela (1970) from Boston College. Cautela asserts that manipulation of covert processes (i.e. imagery) via an operant conditioning paradigm can result in a predictable modification of behavior very similar, if not identical, to that yielded by overt instrumental conditioning utilizing concrete, tangible reinforcers. Cautela (1973) describes several techniques incorporating the covert conditioning process, one of which is "covert positive reinforcement". In this procedure target behaviors are reinforced in the imagination by pleasant mental images. Covert positive reinforcement has been employed in efforts to modify many types of behaviors in clinical and educational settings (Cautela, 1973; Edenfield, 1979; Ladouceur, 1974; Workman, 1977).

Edenfield's (1979) research dealt with the problem of how covert positive reinforcement could be utilized in the improvement of effortful academic behavior in intellectually normal elementary school children. The present investigator addressed the question of whether such a procedure could also be used to improve academic behavior in T.M.H. students with intelligence quotients between approximately 30 and 55. The utility of imagery techniques has reportedly been demonstrated with mental retardates in paired-associate learning paradigms and other learning strategies

(Borreson, 1977; Glicking, 1981; Greeson & Jens, 1977; Zupnick & Meyer, 1975). However, the literature apparently presents little, if any, research involving the use of covert conditioning with the mentally retarded.

Definition of Terms and Concepts

Trainable Mentally Retarded (Handicapped) - Individuals with intelligence quotients between three and approximately five standard deviations below the mean as measured by a major intelligence test, and who possess characteristics of adaptive behavior well below normal expectations for their chronological ages.

Reinforcer Survey - An individual survey procedure used to establish imagery food reinforcers and order of reinforcer preference.

Relaxation Activity Scripts - Taped imagery activities employed to encourage psychologic and muscular relaxation.

Academic Activity - A verbally presented fantasy activity designed to facilitate an imagery scenario of successfully participating in a numeral naming task.

Positive Imagery - A technique whereby a subject is verbally directed to engage in pleasant imagery experiences.

Reinforcer - Anything that tends to increase the frequency of a desired response. In this experiment, such reinforcers were mental images of eating (drinking) good-tasting foods.

Enhanced - Directed imagery that incorporated detailed or elaborate descriptions of food reinforcers.

Nonenhanced - Directed imagery that utilized less detailed descriptions of imagined food reinforcers.

Treatment - Employment of the Relaxation Activities (A and B), Academic Activity, and imaginal reinforcers to Group 2 and Group 3.

Organization of the Remainder of this Study

Chapter II presents a survey of the history of imagery investigation from the beginnings to contemporary psychoeducational research and therapy. An overview of the theories of imagery development in children and imagery research with mentally retarded persons is provided. The latter part of this chapter emphasizes the covert conditioning work of Joseph Cautela (1970) and subsequent studies generated involving an array of clinical and educational problems. Chapter III describes the sampling, instrumentation, experimental procedure, and research design employed in this study. Chapter IV incorporates the presentation of data, statistical analyses utilized, and the results. Chapter V includes the experimenter's discussion of the data outcome, conclusions and implications for education. Recommendations for future research projects in this area are also provided.

CHAPTER II

REVIEW OF THE LITERATURE

The importance and theoretical roles of mental imagery have been addressed for centuries. In De Anima, Aristotle wrote extensively of relationships between thinking and "mental pictures" during the classical era of Greece (Yates, 1966). Aquinas's attempts to incorporate Aristotelian philosophy into Christian doctrine in the thirteenth century emphasized the image as an important component of religious and philosophic thought (Yuille & Marschark, 1983). As early as 1883, Francis Galton made a systematic, empirical investigation of visual imagery via the use of one of the first psychological research questionnaires (Du Bois, 1970). However, Pierre Janet (1898) was perhaps the first clinician to actually implement imagery techniques in efforts to therapeutically change human behavior. He learned that hysterical patients could be trained to change maladaptive, fixed ideas by a method of image substitution in which one visual image is replaced by another (Sheikh & Jordan, 1983).

Sigmund Freud used mental imagery techniques in his investigations of central conflicts and the unconscious. Prior to 1900, Freud employed an interesting imagery procedure in which he pressed the heads of his patients and encouraged them to describe images as he eased the pressure of his hand. Patients reportedly experienced imagined scenes in order of situational chronology which were interpreted by Freud as being related to significant psychologic conflicts. However, around 1900, Freud abandoned this therapy technique and turned to less explicit uses of imagery in the psychoanalytic situation including the interpretations of dreams and free association. Freud later viewed imagery as a defensive resistance that blocks facilitative free association. Although Freud and many of his fellow psychoanalysts ostensibly tended to steer clear of explicit imagery techniques, the methods of traditional psychoanalysis do necessarily incorporate the use of imagery. The emphasis on free association, recollections of dreams, and childhood memories are examples (Sheikh & Jordan, 1983).

Jung enthusiastically utilized mental imagery in a method of therapy he termed "active imagination" which he developed during his exploration of the unconscious mind between 1912 and 1917. Through this technique Jung analyzed images from fantasies, dreams, and hypnagogic experiences. He theorized that the unconscious is in a state of constant "dreaming" and that this mental activity generates a logic that is separate from that of the conscious mind (Jung, 1976; Sheikh & Jordan, 1983).

William James (1899) in his Talks to Teachers on Psychology: And to Students on some of Life's Ideals also discusses the constant flow of consciousness ("stream of consciousness") and alludes to the roles of imaging in the constitution of what he calls "our inner life".

Interestingly, Alfred Binet (1922), primarily recognized for his work in intellectual assessment, made significant contributions in the area of mental imagery. He constructed an introspective technique called the "dialogue method" in which patients were requested to have "dialogue" with their visual images, surfacing insights from unconscious subpersonalities (Sheikh & Jordan, 1983).

Happich (1932) employed a psychotherapy approach which was primarily based on the utilization of images. Happich encouraged his patients to become involved with muscular relaxation and other techniques which facilitate a meditative disposition. Similarly, Kretschmer (1969) constructed a psychotherapeutic method incorporating a systematic meditation format (Sheikh & Jordan, 1983). Schultz and Luthe (1959) developed "autogenic training" which involved instructing patients to imagine pleasant physiological experiences not unlike those feelings which occur in states of hypnosis such as warmth, relaxation, heaviness in the limbs, etc. These modes were among the forerunners of more contemporary relaxation and meditation therapies in Europe and America.

The European "oneirotherapies" ("oneiros" is Greek for "dream") have further developed and perpetuated the procedure of guided fantasy in which the therapist more or less verbally directs the mental imagery experience of his clients. Oneirotherapeutic procedures frequently incorporate an initial relaxation component which can be achieved via actual muscular relaxation training and/or psychologic relaxation by way of visual imagery. The therapist guides the client by presenting verbal descriptions of visual scenes which may be associated with presenting psychologic conflicts including relevant memories of past events, related associations, and so-forth (Sheikh & Jordan, 1983). Desoille's "directed daydream" (1965) greatly facilitated the development of the oneirotherapies and is one of the most systematically directive and structured. Leuner's investigations of guided fantasy, similarly, resulted in his technique of "guided affective imagery" (Leuner, 1977). "Oneirodrama", developed by Frétigny and Virel (1968), was greatly a result of Desoille's (1965) work. The oneirotherapies have primary basis in psychoanalytic assumptions with regard to interpretations and discussion. However, their theorized advantages from a practical, implementation standpoint have greatly influenced more behaviorally-oriented and humanistic approaches. Some of these advantages are: (a) imagery is directed toward the client's emotional experience and thus has potential to tap this realm; (b) the client is not required to possess a high level of sophistication with respect to verbal reflection and introspection; and (c) many of the pitfalls of rational thought are circumvented (Frétigny & Virel, 1968; Sheikh & Jordan, 1983). These advantages obviously could be particularly relevant with regard to potential clients (or students) of developmentally lower cognitive sophistication including young children and intellectually deficient individuals.

A less psychoanalytically-oriented system which employs a more eclectic approach is called "psychosynthesis" by it's originator, the Italian psychiatrist, Roberto Assagioli (1965). Although many of the basic imagery procedures employed in the oneirotherapies are also utilized in psychosynthesis, this therapeutic approach draws on other related methods as well, including Eastern meditative techniques (Sheikh & Jordan, 1983).

Unfortunately, the study of psychology in the United States underwent a rejection of imagery investigation from about 1920 to 1960, largely because of the emergence and the apparent popularity of behaviorism. Watson (1925) and his followers emphasized the importance of supposedly more objective and behaviorally identifiable courses of study and indicated that "private events" such as imagery should receive no attention in psychology (Cautela, 1970). However, with the advent of the reported therapeutic successes of oneirotherapies in Europe, studies on sleep (Kleitman, 1963), sensory deprivation investigations (Hebb, 1960), and neuropsychological research (Penfield & Jaspers, 1954), as well as the growing "third force" or humanistic trends, research in imagery gained renewed interest in North America (Sheikh & Jordan, 1983).

Wolpe (1958) helped pave the way for many other contemporary psychotherapies that utilize relaxation and mental imagery. His "systematic desensitization" procedure can be employed in the eradication of phobias but is also reportedly effective in the treatment of other large varieties of situations which are anxiety-provoking in people (Goldstein, 1973). In systematic desensitization, the client is involved in three separate steps of treatment. During the first, he is taught to relax major muscles which facilitates a state of serenity and calmness. Although hypnosis was initially utilized by Wolpe and his associates, this technique was abandoned in favor of deep muscle relaxation procedures because of maladaptive client dependence that may result in hypnosis. In the second step, the anxiety-producing stimulus situation is separated into a series of parts according to the relative anxiety intensity of each part. During the last step, the client is directed to relax himself via the relaxation training and then systematically requested to visualize through imagery each part of the feared situation in succession of least to most anxiety intensity. If the procedure is successful, the client becomes "densensitized" to the actual situation provoking the anxiety (Lazarus, 1977). Lazarus (1977) utilizes a similar technique of relaxation and imagery in the treatment of an array of disorders such as phobias, psychosomatic disorders, depression, etc., with children as well as adults.

A procedure somewhat different to systematic desensitization is Stampfl and Lewis' (1967) "implosive therapy". This method is designed to initially provoke increasing anxiety in the client by the use of directed imagery. The client is requested to visualize the worst things that could happen to him during the feared or anxiety situation. When these worst things do not occur in real life, the anxiety dissipates.

The following section addresses the development of imaging ability in children and imagery research that has been conducted with intellectually deficient (mentally retarded) individuals.

Imagery Development and Research with Children and Retardates

The ability to participate in imagery may be common to just about everyone. Tower (1983) points out that ". . . imagery appears to be wired into the human organism in much the same way that potentials for language or motor behavior are . . ." (p. 277).

The prerequisites and conditions necessary for the developmental emergence of mental imagery have been addressed by many contemporary researchers. Fein (1975), Rubin, Watson, and Jambon (1978), among others, report a predictable progression of behaviors that incorporate fantasy and mental symbolism, and that this progression is greatly determined by cognitive development and chronological age. Piaget and Inhelder (1969) indicate the existence of two major categories of mental imagery which occur at different developmental stages. "Reproductive images" include perceptions that are taken from memory and are static configurations while anticipatory images involve envisages of action and anticipated transformations. According to Piaget and Inhelder (1969), " . . . the mental images of the child at the preoperatory level are almost exclusively static" (p. 71), and the ability for anticipatory imaging comes later in development. Thus, Piagetian theory places the onset emergence of imagery to be within the preoperational period of cognitive development. Beard (1969) suggests that toward the latter part of the sensorimotor stage some infants can use generated images as an aid in early cognitive thought although they do not have the ability for systematic mental imagery in the thought process. Thus, approximately at the age of 2 years old, children of normal intelligence apparently do have a capacity for the perception and storage of mental images and use this ability to help conceptualize sensory experiences from the external, physical environment.

Interestingly, verbal and imaginal systems usually develop independently in children. Before the integration of these two systems at about a mental age of 7 years, imaginal representations appear to be very important in governing behavior (Forisha & Liikanen, 1975). Since numerous studies have substantiated that the quantity and quality of language by mental retardates are almost always inferior to that of nonretardates (Webb & Kinde, 1967), perhaps retarded individuals with mental ages below the age of 7 years utilize cognitive strategies largely dependent upon intact imaginal systems that are independent from verbal ability.

It should be noted that Tower (1983) emphasizes that other factors than cognitive development (inferring neural maturation) can have great effect on the emergence, development, and quality of imagery. Some of these include: affective organization, feelings of emotional security, opportunity for imagery modelling, freedom from physical or sensory deprivation, structure in the environmental setting, and privacy.

There appear to be cognitive and affective benefits that are derived from the development of imaginal systems. Play that involves mental imagery may be a necessary component in the adaptive growth and development of the child (Lugo & Hershey, 1974). Tower (1980) cites the following cognitive and affective benefits that are facilitated by imagery: attention and concentration, memory, language development, organization of thinking, divergent thinking, a differentiated sense of personal identity, resources for dealing with stressful situations, self-control, and positive emotional experiences.

Emphasis on the importance of cognitive development with regard to imaging abilities raises the question of imaging capacity in mentally retarded individuals. Retarded children have mental ages more equivalent to those of younger children with normal intelligence. Borys (1980) administered Kinetic imagery tasks to young adults who were educable mentally retarded. She found that the subjects had significant difficulty with tasks involving mental rotations of three block figures. Indeed, the research suggested that the retarded adults with mental ages ranging from 8 to 12 years performed more similarly to nonretarded children with a mental age of only 7 years. The ability for imagery involving more complex rotations was concluded to be generally poor for these subjects.

Bender (1977) investigated the potential benefits of presenting educable mentally retarded children with directions to generate mental images while they listened to a short story. Twenty questions measured subjects' performance. The subjects did not do well on the task. Bender emphasizes that concrete training may be the only way to facilitate generated imagery in retardates and that the failure by these individuals to demonstrate their capacity for imaging may be merely a function of a lack of appropriate training. He further states these results were not interpreted as being indication that mental retardates do not have the ability to use imagery to help them learn new skills.

Bender and Levin (1978) emphasize that "the degree to which the retardate experiences a deficiency in his or her ability to employ . . . imagery strategies varies with task characteristics . . ." (p. 587). However, they also indicate that there appears to be a skill ability by many educable mentally retarded subjects to learn effective imagery training.

It should be noted that some research findings involving the use of imagery techniques with mentally retarded persons report encouraging results. Borreson (1977) compared the efficacy of different mediational strategies in paired-associate learning with retarded and nonretarded groups. One of the strategies involved training subjects to generate images of certain words as a means to learn new words that rhyme with them. Borreson found that imagery strategies were significantly functional for retarded subjects in the paired-associated learning task. Greeson and Jens (1977), similarly found that the use of imagery and verbal mediation in conjunction with instructional modelling aided trainable mentally retarded students in a paired-associated learning task.

Zupnick and Meyer (1975) conducted a study in order to evaluate the long-term effectiveness of imagery directions with educable mentally retarded subjects with mental ages of 8 and 11 years old. They note that ". . . moderately retarded children are capable of using imagery instructions to increase paired-associate learning efficiency shortly after receiving them and for at least a week thereafter" (p. 527).

Glicking (1981) found that both nonretarded and retarded children were able to recognize and retain high imagery nouns better than low imagery nouns, suggesting a functional strategy of visual imagery. Yarmey and Bowen (1972) investigated how instructions to utilize imagery affects intentional and incidental learning in retarded and nonretarded children. The results indicated that the imagery instructions were effective.

It should be noted that although the above studies did employ imagery-related treatment strategies, there apparently has been little research conducted that has utilized imagery in conditioning paradigms with retarded individuals. The roles of imagery in overt and covert conditioning procedures are described in the next section.

Imagery in Overt and Covert Reinforcement Techniques

Donald King (1983) presents an "image theory of conditioning" which attempts to explain the underlying perceptual substrates of both classical and instrumental conditioning procedures in humans. The theory suggests that overt conditioning techniques may necessarily involve mental imagery in the human organism. During the process in which a physical stimulus is perceived by the organism, a "temporary neural representation" is believed to result. This temporary representation mediates the behaviors and experiences of the organism as reaction to the stimulus. A more permanent neural representation becomes established from the temporary one. This permanent representation also corresponds to the stimulus. Even in physical absence of the outside stimulus, an activation of the permanent neural representation may eventually result in behavioral and experential effects. These effects can include an "image" of the real (outside) stimulus involving a mental description of it, decision-making regarding the stimulus, and a production of behavioral responses that are very similar to those usually elicited by the physical stimulus. During overt instrumental conditioning, humans have a tendency to imagine those stimuli (either positive or negative reinforcement) that will likely be approached or avoided. According to this theory, the nervous system operates in such a way as to increase the amounts of positive outside stimuli or neural representations that correspond to such stimuli. Thus, the organism behaves or "responds" in such a way as to gain positive reinforcement. King (1983) cites studies that strongly suggest that imagined stimuli affect behavior in very similar ways as so-called real stimuli. Wooley and Wooley (1973) provide supportive evidence that salivation accompanies thought about food. Similarly, Barber and colleagues (1964) indicate that when subjects are instructed to imagine that plain tap water has been soured, increased salivation results. Other research studies document changes in heart rate, muscle tension, and electromyographic activity during imagery experiments (Barber & Hahn, 1964; Jacobsen, 1930). Image-related responses are characterized as being similar to stimulus-produced responses.

Cautela (1970) developed a series of treatment procedures he terms "covert reinforcement" techniques. He states that "the term 'covert' is used because the response and reinforcing stimulus are presented in imagination. The word 'reinforcement' is employed because the purpose of the procedure is to increase response probability" (Cautela, 1970, p. 33). A number of techniques are described including covert modelling, covert sensitization, covert extinction, covert response cost, covert positive reinforcement, and covert negative reinforcement (Sheikh & Jordan, 1983). Two major assumptions provide a basis for Cautela's conditioning techniques. The first indicates that a functional equivalence exists between covert stimuli and external or overt stimuli. The second states that overt events or processes can be influenced by the manipulation of covert processes and that these influences are predictable (Cautela, 1970). Mahoney (1974) suggests a third "automaticity assumption". According to this assumption, when two events, including covert events, are paired in a temporal contiguity, conditioning automatically will occur. Cautela (1973) emphasizes that many notable behaviorists have acknowledged the probable validity of covert operants in conditioning such as B.F. Skinner (1969), Pavlov (1927), and Homme (1965). There are several advantages of employing imagery in conditioning procedures: (1) the presentation of aversive covert stimuli does not tend to result in as many client "drop-outs" during treatment as with aversive external stimuli; (2) clients can generate the necessary imagery for conditioning almost anywhere whenever the need arises; (3) both the client and the therapist are less reliant on cumbersome, expensive equipment; and (4) imagery is not bound by the limits of practical reality,allowing the client opportunity to be exposed to events and situations otherwise impractical (Cautela, 1973).

Covert modeling (Cautela and Flannery, 1974) involves directing the client to imagine other individuals participating in desired behaviors. In certain cases, covert modeling has been found to be as effective as overt modeling procedures. Covert sensitization is somewhat analogous to the procedure of overt punishment. The client is presented imagery exercises in which scenes of maladaptive behaviors are immediately followed by covert aversive stimuli (Cautela, 1973). During the procedure of covert extinction, the client imagines the behavior that is to be eradicated and then imagines that he does not receive the existing environmental reinforcers that have been maintaining the behavior in the real world (Cautela, 1973). In covert negative reinforcement, the client is requested to visualize a noxious, unpleasant scene. Then he is directed to imagine his participation in the adaptive behavior that is trying to be increased in frequency. The unpleasant scenes are terminated after presentation of the image of the desired behavior. This termination, thus, becomes reinforcement for the occurrence of the adaptive behavior (Ascher & Cautela, 1972). Covert positive reinforcement is similar in procedural format to the overt positive reinforcement paradigm (e.g. Skinnerian types of conditioning). The client images participation in the desired behavior and then imagines receiving stimuli that are positively reinforcing to him. A variety of covert positive reinforcers should be utilized in order to offset satiation as would be the case with employment of overt reinforcement (Cautela, 1973).

Since covert positive reinforcement is the primary treatment technique that was employed in this writer's presenting study, a detailed description of the procedural steps will be addressed. Many of the covert reinforcement procedures described above also incorporate several of these steps, as well. The first step is to identify possible reinforcers. Cautela (1970) cites possible ways of accomplishing this task. Cautela and Kastenbaum (1967) formalized a Reinforcement Survey Schedule consisting of 54 items, which is designed to compile a reinforcer pool for each client, and provides a rank-ordering of these stimuli from least pleasurable to most pleasurable. As would be expected, preference and quality of reinforcers do have significant effect on effectiveness to increase desired responding (Hutt, 1954; Guttman, 1963). A simpler and popular method of reinforcer identification involves asking the client (or those knowledgeable of him) what he finds the most pleasurable to eat, drink, etc. Reinforcers can also include imagined participation in favorite activities such as skiing down a mountain, swimming, and so-forth (Cautela, 1970).

Cautela (1973) states that formal relaxation prior to implementation of the covert positive reinforcement procedure is not necessarily needed. However, other researchers (Edenfield, 1979; Lazarus, 1977) suggest that abbreviated relaxation training may help subjects focus their attention on the examiner's taped voice, reduce novelty effect and initial feelings of embarrassment, and decrease tendency toward distracting psychomotor activity. In addition, the relaxation activities utilized in Edenfield's (1979) study and those in the presenting research do include directions designed to encourage the elicitation of scenes in the imagination.

After reinforcers are identified, the client usually undergoes a number of treatment sessions in which imaginary scenes are verbally presented by the therapist. Sometimes covert reinforcers are ostensibly identified as "reinforcement" to the client. Fantasy scenarios are presented and imagined participation in desired target behaviors or successive approximations to target behaviors are immediately proceeded by a description of reinforcement or merely the statement of the word "reinforcement" as a cue for the client to mentally generate an image of the reinforcer. Cautela (1970) also frequently periodically asks that the client relate whether the images are clear during the course of the fantasy presentation. At times, the client is directed to practice the entire sequence as homework, and urged to really participate in the desired behavior when possible.

The following is an example cited by Cautela (1973) that illustrates the covert positive reinforcement procedure. The client was male and being treated for homosexuality. The target behavior was to telephone a girl for a date. In previous sessions, Cautela investigated potential reinforcing images and found "swimming on a hot day" and feeling refreshed to be an excellent covert reinforcer for this client. The client was instructed to do the following in the covert positive reinforcement procedure:

> In a minute I'm going to ask you to try to relax and close your eyes. Then I will describe a scene to you . . . . I will then say the word "reinforcement." As soon as I say the word "reinforcement" try to imagine the reinforcing scene we practiced before, the one about swimming on a hot day, feeling the refreshing water, and feeling wonderful. As soon as the reinforcing scene is clear, raise your finger . . . . All right, now close your eyes and try to relax . . . . I want you to imagine that you are at home in the kitchen and you say to yourself, "I think I'll call Jane for a date." As soon as you have the scene clearly, raise your finger. (When he raises his finger to signal clear imagery, the therapist says "reinforcement") . . . . After you've decided to call Jane, you walk toward the phone and you start to dial . . . . ("Reinforcement.") You have finished dialing. Jane answers. You say, "Hello" and ask her if she is free Saturday night and tell her that you would like to take her out . . . . ("Reinforcement.") Now do the whole procedure yourself . . . . (Cautela, 1973, p. 30)

The following section describes research studies that have employed covert positive reinforcement procedures.

Covert Positive Reinforcement Studies

Covert positive reinforcement treatment paradigms have been utilized in an array of clinical and educational settings in efforts to facilitate desirable behaviors. Scott and Rosenstiel (1975) present an in-depth review and critique of several major covert positive reinforcement studies. They state that such treatment procedures ". . . have been successfully used in treating a number of seemingly intractable cases, such as heroin addiction . . . intravenous amphetamine addiction . . . severe self-injurous behavior . . . transsexualism . . . obsessive-complusive behavior . . . agraphobic behavior . . . and suicidal attempts" (p. 374). They indicate that, although research investigations into specific procedural variables should continue, the studies that were reviewed did suggest that covert reinforcement is an effective procedure.

Krop, Messinger, and Reiner (1974) employed a covert reinforcement procedure in effort to increase duration of eye contact with 114 unmarried university students at the University of Florida. One treatment group received covert positive reinforcement noncontingently. Another treatment group was given covert positive reinforcement contingently (i.e. a covert reinforcer upon subject presentation of eye contact lasting at least 5 seconds). The subjects in the control group received no reinforcement, either overt or covert. Eye contact was significantly increased only in the treatment group in which covert reinforcement was contingently presented. However, long-term effects of the covert conditioning procedure could not be demonstrated.

Ladouceur,(1974) tested a hypothesis that covert positive reinforcement could decrease anxiety among 30 college students who initially had a fear of rats. The outcome did indicate the covert conditioning to be effective with regard to the modification of anxiety-related rat phobia. The actual efficacy of covert reinforcement as a true operant conditioning technique was questioned, however, since a reversed covert reinforcement procedure also demonstrated similar success in reducing anxiety (i.e. covert reinforcement preceded the imagined target behavior rather than proceeding it).

Kearney (1976) demonstrated that covert positive reinforcement was at least as equally effective as systematic desensitization with regard to the treatment of anxiety induced by laboratory rats in 75 high school girls. Kearney suggested that since covert reinforcement is less time consuming and not as complicated as desensitization to employ, it should be the procedure of choice.

Cautela (1970) reported what later became a classical illustration of the use of covert reinforcement as a technique to decrease anxiety. The client was a doctoral student who had flunked his qualifying examination several times, evidently because of severe text anxiety. Two of the covert reinforcers included the pleasant image of snow skiing and the scene of graduating with the doctoral degree. The results of ten sessions were dramatic and the client passed the qualifying exam.

Workman and Dickinson (1979) used the covert positive reinforcement procedure in the treatment of a 9 year old, hyperactive, third grade girl in a classroom setting. The target behaviors were to reduce excessive noisemaking in class, out-of-seat behavior, and rocking-in-chair behavior. After employment of the covert conditioning procedure by the school psychologist, a significant reduction in all three target behaviors resulted.

Shefrin (1976) investigated how covert positive reinforcement might be used to maintain effortful behavior in children ages 7 to 9 years old. The behavior to be modified was the number of turns on a crank by each child over time. Although the results were not significantly conclusive that the covert positive reinforcement treatment group improved over the control group, the data did suggest that treatment subjects who had a high predisposition toward fantasy did better on the target task than treatment subjects who had a lower fantasy predisposition.

A study by Workman (1977) failed to demonstrate the effectiveness of covert positive reinforcement procedures in efforts to increase on-task-behavior with elementary school children in a group setting. However, he noted that procedural deficits that deviated from Cautela's (1970) covert positive reinforcement technique may have accounted for the lack of significant success.

Edenfield (1979) investigated how the speed and accuracy of simple one-digit addition by normal fifth-grade students can be affected by covert positive reinforcement. The design and rationale of the writer's experiment were suggested and greatly influenced by this study. Three hundred forty-two fifth-graders in 12 intact classrooms were randomly assigned to six groups. Two groups were controls and received no treatment, two received nonenhanced imagery treatment, and two groups were administered enhanced imagery treatment. The enhanced imagery condition included imagery descriptions that were more elaborate and detailed than in the nonenhanced condition. Five favorite foods were identified as covert reinforcers.

All subjects were administered a pretest consisting of simple one-digit addition problems. The treatment groups received five treatment sessions consisting of an abbreviated relaxation activity, an imagery activity describing success on the arithmetic pretest (posttest) procedure, and either enhanced or non-enhanced descriptions of consuming the covert reinforcers. The posttest (the same as the pretest) was then administered and gain in accurate arithmetic computation assessed. The results indicated that the covert positive reinforcement procedure did have a significant effect with regard to improving accurate arithmetic computation. However, descriptive enhancement of imagery reinforcement was not found to be more facilitative of the academic computation task than the non-enhanced condition.

CHAPTER III

METHODOLOGY

Subjects

The subjects for the present study were 50 T.M.H. students from Hillcrest School, a self-contained, nonresidential school for the trainable mentally handicapped and autistic in the Marion County School System. Potential subjects were referred by the school principal, guidance counselor, and teachers. All subjects were volunteers and were selected on the basis of having adequate auditory and visual acuities, and understandable speech. Seven of the subjects had to be dropped during the course of the study for various reasons including: absenteeism, interfering physical handicaps, and inadequate attention-span. Of the subjects remaining, 22 were male and 21 female. Twenty-six of the subjects were Caucasian and 17 were Black. Chronological ages ranged from 7 to 21 years. Intelligence Quotients were between 33 and 54, inclusive. The subjects, with two exceptions, had been psychometrically assessed within approximately the last three years on the Stanford-Binet Intelligence Scale, Wechsler Intelligence Scale for Children (Revised), Wechsler Adult Intelligence Scale, or Leiter International Performance Scale. It should be noted that the I.Q. scores of two of the subjects were not included in analysis of the data because of a lack of updated scores. All of the subjects officially meet state criteria for placement into T.M.H. programs in Florida and are legally staffed into this exceptionality.

Instrumentation

A "reinforcer survey" similar to the one used in Edenfield's (1979) study was employed as a means to identify a rank-order of favorite food reinforcers of subjects. This survey consisted of five foods identified by Edenfield (1979) in normal fifth grade students who attend Marion County Schools, and seem typical of favorite foods of most children and young adults in this geographical region. These foods were: Cookies, candy bars, cake, ice cream, and cold drinks. Subjects were individually read the "Instructions for the Favorite Foods Reinforcer Survey" (Appendix B) and the five foods were rank-ordered for preference on the "Reinforcer Survey" form (Appendix C). The subjects given the survey indicated that they liked all of the five foods. Weighted frequencies were totalled for each of the reinforcers across subjects. A cumulative rank-order for preference was derived. The rank-order from "least favorite" to "most favorite" was: ice cream, cold drinks and cake (equal in weight), cookies and candy bars. A flip of a coin determined that cold drinks would precede cake in rank-order.

Two similar relaxation activity scripts were written, the contents of which were greatly based on the "Script for the Abbreviated Relaxation Exercise" as cited by Edenfield (1979) and clinical relaxation procedures described by Lazarus (1977). The scripts entitled "Relaxation Activity A" (Appendix E) and "Relaxation Activity B" (Appendix F) included a procedure designed to facilitate an experience of physical and psychological relaxation for treatment subjects prior to employment of the directed positive imagery. "Relaxation Activity A" was approximately 3½ minutes in duration and "Relaxation Activity B" lasted approximately 3 minutes 10 seconds. Each activity involved asking the subjects to close their eyes, get in a comfortable position, and pretend themselves participating in certain activities conducive to imaging and relaxation. For example, during the exercises, the subjects were directed to actually tighten and relax certain muscles in the body as a means to facilitate muscle relaxation. In "Relaxation Activity A", the subjects were requested to tighten and relax their hands, visualizing themselves squeezing a rubber ball. The script for "Relaxation Activity B" asked the treatment subjects to "squish" their toes in imagined soft, green grass on a warm, sunny day. It should be noted that Edenfield (1979) included one version of his relaxation activity in all treatments. In effort to offset possible inattention and boredom by the T.M.H. subjects, two versions were employed in alternating treatments in the presenting study.

An imagery script entitled "Academic Activity" (Appendix G) was devised and included descriptions of successfully participating in a numeral naming task. This activity was approximately 2 minutes in length.

Directed positive imagery "reinforcer" scripts for ice cream, cold drinks, cake, cookies, and candy bars (Appendices H through Q) were written similar to Edenfield's (1979) treatment procedures. The scripts were comprised of short, concise sentences, and vocabulary designed for easy comprehension by the T.M.H. subjects. Reinforcer scripts directed the subjects to imagine themselves eating (or drinking) the above described foods. Five of the scripts incorporated elaborate descriptions of the foods ("Enhanced Ice Cream", "Enhanced Cold Drinks", "Enhanced Cake", "Enhanced Cookies", "Enhanced Candy Bar"). The remaining five reinforcer scripts were comprised of nonenhanced descriptions ("Nonenhanced Ice Cream", "Nonenhanced Cold Drinks", "Nonenhanced Cake", "Nonenhanced Cookies", "Nonenhanced Candy Bar"). Enhanced reinforcer scripts were approximately 3½ minutes in length and nonenhanced scripts were approximately 1 minute 40 seconds in duration.

The two relaxation scripts, "Academic Activity Script", and 10 reinforcer scripts were recorded by the Experimenter on standard audiotape cassettes. A cassette tape recorder and headphones were used in the administration of treatment.

One hundred-forty photographic slides each showing one numeral between 1 and 20, were randomized and placed in a carousel on a slide projector apparatus with a viewing monitor similar to a television screen (Kodak Ringmaster). A remote-control extension was attached which allowed the experimenter to rapidly change the numerals projected on the screen.

The academic task of identifying and naming numerals between 1 and 20 (pretest and posttest) was chosen as target behavior because: (a) it is a specified instructional objective as defined by the State Department of Education (1974) for trainable mentally handicapped students; (b) the task is easily assessed and recorded for speed and accuracy; and (c) T.M.H. students generally are acquainted with the task but find it somewhat difficult. The ability to identify numbers is obviously an important aspect in effectively dealing with the social and work environment.

Procedure and Design

Approximately one week prior to implementation of the experimental procedure, all 50 subjects were individually and orally administered the previously described "Reinforcer Survey". The following week the pretest was given individually to the subjects in a quiet room at the school facility. Testing procedures were as follows: The slide projector apparatus was positioned on a table approximately 2 feet in front of the subject who was seated. The experimenter, operating the projector via the remote-control extension, sat behind the subject. Before turning on the viewing screen monitor, the experimenter read the "Instructions for Pretest (Posttest)" (Appendix D) to the subject which directed him to name the numerals to be shown as accurately and quickly as possible. In situations in which he did not know the name of the number, he was instructed to guess or say: "I don't know". For 2 minutes 30 seconds, the individual subjects were shown the randomized numerals one at a time. After the subjects responded to a slide, another one was presented in succession. Subjects responses were recorded on a pretest-posttest response sheet. The 2 minute 30 second testing duration was selected because this time period was found by the experimenter to be a few seconds over the time capability of the apparatus to display all 140 slides as quickly as possible. This duration also was observed to be commensurate with the attention spans of many of the younger T.M.H. subjects while participating on this task.

Immediately after employment of the pretest procedure, all 50 subjects were randomly assigned to three groups. The groups were designated as follows: Group 1 received the pretest, no treatment, and the posttest; Group 2 received the pretest, enhanced reinforcer imagery treatment, and posttest; and Group 3 received the pretest, nonenhanced reinforcer imagery treatment, and posttest. Group 1 was considered the control group and Groups 2 and 3 comprised the two treatment groups. After seven subjects were dropped during the course of the study, the number of subjects in Group 1, Group 2, and Group 3 were 14, 13, and 16, respectively.

Five experimental treatment sessions were administered to Groups 2 and 3 within a two week period. Treatment #1 and Treatment #2 were employed during the first week and Treatment #3, Treatment #4 and Treatment #5 were administered during the second week. Treatments were presented via audiotape and were done in the same room as the pretest. During treatments, the room was darkened. The subjects were played the treatment tapes through headphones, in groups of up to five at one time. Distractability was discouraged by seating the subjects around a rectangular table and facing them away from the center toward the walls. Treatments were presented via audiotapes in order to provide consistency and reliability of administration. Headphones were employed as a means of screening out extraneous noises from students or teachers outside of the room, etc. Treatment #1 included "Relaxation Activity A" followed by the "Academic Activity" which was immediately followed by either the enhanced or nonenhanced ice cream reinforcer imagery scripts, depending on whether the subjects were in Group 2 or Group 3. Similarly, Treatment #3 and Treatment #5 were comprised of "Relaxation Activity A", the "Academic Activity", and enhanced or nonenhanced cake and candy bar reinforcer imagery scripts, respectively. Treatment #2 and Treatment #4 consisted of "Relaxation Activity B", the Academic Activity", and enhanced or nonenhanced cold drinks and cookie reinforcer imagery scripts, respectively. It should be noted that reinforcer imagery scripts were administered to subjects in order of "least favorite" to "most favorite" (i.e. from ice cream in Treatment #1 to candy bars in Treatment #5) in efforts to provide a "momentum" of covert positive reinforcement prior to the actual employment of the posttest. This procedure was also employed by Edenfield (1979).

Within three days after completion of Treatment #5, all subjects, including those in Group 1, were individually administered the posttest. Instructions and procedural format were identical to that of the pretest.

Hypotheses

It was hypothesized that the use of covert reinforcement would have a positive effect on the speed and accuracy of the treatment subjects' performance on the numeral naming task. Pretreatment exposure to the numeral naming task was hypothesized to have no effect on the outcome measures of the conditioning procedure. It was further hypothesized that the enhanced imagery treatment would result in better performance on the numeral naming task than the nonenhanced imagery treatment. Although Edenfield (1979) did not find a significant difference between the enhanced and nonenhanced treatment groups on the academic performance task in his study, it was strongly hypothesized that T.M.H. students would perform better when presented more descriptive imagery reinforcers (i.e., detailed, concrete descriptions).

This study tested the following subhypotheses:

Subhypothesis 1: There will be no significant differences among pretest measures of numeral naming performance for Group 1, receiving no treatment, Group 2, receiving enhanced imagery reinforcement, and Group 3, receiving nonenhanced imagery reinforcement.

Subhypothesis 2: There will be significant differences among posttest measures of performance for Group 1, receiving no treatment, Group 2, receiving enhanced covert reinforcement, and Group 3, receiving nonenhanced imagery reinforcement.

Subhypothesis 3: There will be a significant difference between the pretest measure of performance of Group 1, receiving no treatment, and the posttest measure of performance of Group 2, receiving enhanced imagery reinforcement.

Subhypothesis 4: There will be a significant difference between the pretest measure of performance of Group 1, receiving no treatment, and the posttest measure of performance of Group 3, receiving nonenhanced covert reinforcement.

Subhypothesis 5: There will be no significant difference between the pretest measure of performance of Group 2, receiving enhanced imagery reinforcement and the posttest measure of performance of Group 1, receiving no treatment.

Subhypothesis 6: There will be a significant difference between the pretest measure of performance of Group 2, receiving enhanced covert reinforcement, and the posttest measure of performance of Group 3, receiving nonenhanced imagery reinforcement.

Subhypothesis 7: There will be no significant difference between the pretest measure of performance of Group 3, receiving nonenhanced covert reinforcement, and the posttest measure of performance of Group 1, receiving no treatment.

Subhypothesis 8: There will be a significant difference between the pretest measure of performance of Group 3, receiving nonenhanced imagery reinforcement, and the posttest measure of performance of Group 2, receiving enhanced covert reinforcement.

Subhypothesis 9: There will be no significant within group differences of numeral naming performance measures in Group 1, receiving no treatment.

Subhypothesis 10: There will be significant within group differences of numeral naming performance measures in Group 2, receiving enhanced imagery reinforcement.

Subhypothesis 11: There will be significant within group differences of performance measures in Group 3, receiving nonenhanced covert reinforcement.

CHAPTER IV

ANALYSES AND RESULTS

The purpose of this study was to investigate whether a covert positive reinforcement technique could be utilized to modify academic behavior in T.M.H. students. A comparison of the efficacy of employing enhanced and nonenhanced reinforcement procedures was also conducted. It was hypothesized that the speed and accuracy of numeral naming would be significantly improved after the conditioning treatments, and that nonenhanced imagery treatments would have less positive effect on performance than enhanced imagery treatments.

The computer system in the Northeast Regional Data Center at the University of Florida was used in the analysis of the research data. The Biomedical Computer Program (BMDP), (Dixon & Brown, 1979) and the Statistical Analysis System (SAS), (Barr, Goodnight, & Sall, 1979) were the statistical analysis programs employed.

The major dependent variable was the number of correct answers by each subject within the 2½ minute time limit on the numeral naming task. In the comparison of group performance on this academic task, a multifactor analysis of variance (ANOVA) was utilized, based on a 2 x 3 factorial design (pretest, posttest X Group 1, Group 2, Group 3). The Scheffe' Method was employed to assess any possible simple effects. All subhypotheses were tested at the .05 level of probability.

Pearson product moment correlation coefficients were calculated as a means to test strengths of relationships between the variables of group membership, sex, chronological age, race, I.Q., pretests (number correct and number attempted), and posttests (number correct and number attempted).

In order to test for increased speed on the academic task, irrespective of task accuracy, after employment of treatments, a multifactor ANOVA for "number attempted" on the numeral naming task as the dependent variable was employed. Possible percentage increases were also calculated from ratios of "number attempted" to "number correct" for each posttest of the three groups.

Performance means (and standard deviations) on the pretest (number correct) for Group 1, Group 2, and Group 3 were 39.64 (17.79), 49.69 (16.2), and 41.94 (19.91), respectively. Performance means (and standard deviations) on the posttest (number correct) for Groups 1, 2, and 3 were 40.21 (21.26), 53.54 (13.61), and 47 (18.84), respectively.

Similarly, performance means (and standard deviations) on the pretest for "number attempted" were 48.57 (11.95), 54.77 (11.5), and 52.13 (11.68) for Groups 1, 2, and 3, respectively. And the means (and standard deviations) for the posttest (number attempted) for the three groups were 50.36 (12.98), 57.62 (9.9), and 56.06 (10.21), respectively.

The results of the ANOVA for number correct by experimental subjects are presented in Table 1. Table 2 (Appendix A) summarizes

Table 1

Results of ANOVA for Number Correct

Source	df	SS	MS	F
Between Subjects	42			
Group Membership	2	1865.06	932.53	1.47
Error	40	25383.48	634.59	
Within Subjects	43			
Pre- Posttest (Correct)	1	213.12	213.12	6.79*
Group X Pre- Posttest	2	78.81	39.40	1.26
Error	40	1255.03	31.38	
Total	85			

* $\underline{p} < .05$

the findings from the ANOVA in the assessment of number attempted, irrespective of number correct. Figure 1 illustrates the results of the pretest and posttest (number correct) for Groups 1, 2, and 3.

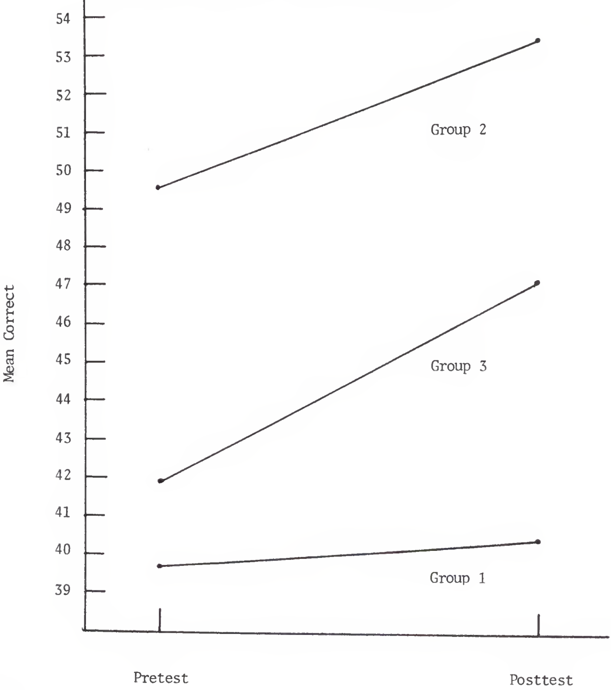
As predicted, Subhypothesis 1 was supported. There were no significant differences between pretest measures of numeral naming performance for Groups 1, 2, and 3. However, Subhypothesis 2 was not supported. There were no significant differences between the posttest measures of the three experimental groups. Therefore, the nonenhanced and enhanced treatment groups apparently did not perform significantly better on the posttest than the control group. Also, the enhanced treatment group did not do significantly better than the nonenhanced group on the posttest, contrary to a primary hypothesis that T.M.H. students would perform more proficiently on the academic task after covert conditioning incorporating detailed, enhanced reinforcement.

Subhypotheses 3 and 4 predicted significant differences between the pretest mean score of Group 1 and the posttest performance scores of Groups 2 and 3, respectively. These subhypotheses were not supported which is generally commensurate with the outcome results for Subhypotheses 1 and 2.

Subhypothesis 5 was supported which indicated no significant difference between the pretest score of Group 2 and the posttest score of Group 1. Similarly, Subhypothesis 7 which predicted no

Figure 1

Results of Pretest to Posttest Performance



significant difference between the pretest score of Group 3 and the posttest score of Group 1 was supported.

The testing of Subhypothesis 6 did not show a statistical difference between the pretest score of Group 2 and the posttest score of Group 3. Subhypothesis 8 was also not supported, indicating a lack of statistical significance between the pretest mean score of Group 3 and the posttest performance score of Group 2.

Although no significant pretest and posttest differences were found in Group 2 (thus a rejection of Subhypothesis 10), there was support for accepting Subhypothesis 11 which predicted a significant change in pretest to posttest performance. It should be noted that calculation with the Scheffe' Method did not indicate evidence to accept Subhypothesis 11 with regard to "number attempted", only "number correct" by subjects.

As would be expected, there were no significant within-group differences in the control group,which lends support for a general hypothesis that pretreatment exposure to the numeral naming task had no effect on the outcome measures of the conditioning procedure.

As indicated previously, Pearson product moment correlation coefficients were calculated in order to assess strengths of relationships between relevant variables. The correlation between the pretest and posttest scores for number correct across all three groups was high ($\underline{r}$ = .907). Similarly, the relationship between the pretest and posttest scores for number "attempted" was strong ($\underline{r}$ = .831). Pretest- posttest performance reliability is supported. Weak associations were noted between I.Q. and pretest and posttest mean scores ($\underline{r}$ = -.022 and $\underline{r}$ = .02, respectively). Of possible interest were the correlations between chronological age and the pretest, posttest scores for number correct ($\underline{r}$ = .358 and $\underline{r}$ = .385, respectively), and for number attempted ($\underline{r}$ = .396 and $\underline{r}$ = .486, respectively). Although these correlation coefficients are not extremely high, a relationship between chronological age and performance on the academic task could be connoted.

The following section presents a discussion and conclusions of the above results.

CHAPTER V

DISCUSSION AND CONCLUSIONS

The hypothesis that the employment of covert reinforcement would have a positive effect on the speed and accuracy of the treatment subjects' performance on the academic task was not completely supported. There were no significant differences between the posttest measures of the control group (Group 1), the enhanced treatment group (Group 2), and the nonenhanced treatment group (Group 3). Subhypothesis 2, predicting posttest differences, was rejected. It, therefore, cannot be inferred that the subjects in Groups 2 and 3 did better on the numeral naming task than those subjects in Group 1 because of covert positive reinforcement conditioning.

The general hypothesis that pretreatment exposure to the academic task of numeral naming would have no effect on the outcome measures of the conditioning procedure was supported by the acceptance of Subhypothesis 9. As predicted, there were no significant within-group differences of numeral naming performance measures in Group 1, receiving no treatment. Obviously, the hypothesis of no pretreatment exposure effect is dependent upon the assumption that Group 1 was initially equivalent to Groups 2 and 3 by virtue of the randomization process in the group assignment procedure.

Enhanced imagery treatment did not appear to result in better performance on the numeral naming task than the nonenhanced imagery treatment (a rejection of Subhypothesis 2). It is interesting that Edenfield's (1979) study also did not demonstrate an advantage of enhanced over nonenhanced treatment with intellectually normal fifth graders with respect to performance on simple addition problems.

Since Subhypothesis 10 was rejected, it cannot be assumed that enhanced covert reinforcement treatment had a significant effect on the improvement of performance on the academic task in Group 2. This is very interesting in context of the finding that there was a significant within group difference (pretest to posttest) on performance of the same task in Group 3 which received nonenhanced covert reinforcement (acceptance of Subhypothesis 11). Although no significant posttest differences were found between Groups 2 and 3, it can be speculated that nonenhanced treatment had greater efficacy on performance since pretest to posttest inprovement was found in Group 3 (nonenhanced) but not in Group 2 (enhanced).

The question arises as to why nonenhanced treatment may have been more effective than enhanced treatment. One possibility may relate to the time duration of the nonenhanced reinforcement script (approximately 1 minute 40 seconds) as compared to the time length of the enhanced reinforcement script (about 3½ minutes). As virtually every teacher of the trainable mentally handicapped would quickly attest, the attention spans of this student population are relatively short in comparison to intellectually normal groups of equivalent chronological ages. It can be speculated that the shorter length of the nonenhanced treatment was more conducive to the characteristic attention spans of these students and, therefore, helped facilitate the covert conditioning process. It should be noted that Edenfield's (1979) enhanced and nonenhanced reinforcement treatments were approximately equivalent in length (about 4 minutes) and, therefore, this possible explanation could not be generalized to his findings of no difference between enhanced and nonenhanced treatment group performance. The amount of material content in the enhanced versus nonenhanced treatment scripts may also have been a relevant factor in the apparent superiority of reinforcement in Group 3 over Group 2. It can be speculated that the T.M.H. subjects in the enhanced treatment group were simply "overwhelmed" by not only time length but also the abundance of script content to be cognitively processed. This premise is directly converse to this researcher's initial hypothesis that T.M.H. students would be better conditioned by detailed, concrete descriptions of reinforcers. It is possible that subjects in Group 2 may have been confused (or even bored) by all of the enhanced detail employed.

Acceptance of Subhypotheses 5 and 7 is not surprising since pretest differences were not found between the three groups. The support for these two subhypotheses merely indicate that no significant differences were found between the pretest measures of the two treatment groups and the posttest measures of the control group.

Subhypotheses 3 and 4 were not supported, indicating no differences between the pretest performance of Group 1 and the posttest measures of Groups 2 and 3, respectively. Since there were no statistical differences between posttest measures of all three groups and no differences were found between the respective pretests, rejection of both Subhypotheses 3 and 4 is commensurate with other major findings of the study.

Similarly, Subhypothesis 6 which predicted a significant difference between the pretest performance of Group 2 and the posttest of Group 3 was rejected. And the testing of Subhypothesis 8 did not yield support for a significant difference between the pretest of Group 3 and the posttest of Group 2.

The reader should note the results of pretest to posttest means that compares the three experimental groups in Figure 1 (p. 42). Although the test for simple effects was not indicative of statistical significance except within Group 3, some differences may be evident. As indicated previously, the post hoc multiple comparison procedure utilized to test for simple effects was the Scheffe' Method. It should be emphasized that the Scheffe', although a most versatile procedure and appropriate for "unequal n" comparisons, is also a very conservative method (Hinkel, Wiersma, & Jurs, 1979). This technique's stringent conservatism may partly account for the lack of significance in the results of this study.

This research study also investigated whether the treatment procedures would have any different effect on numeral naming performance with regard to the number of posttest items "attempted", regardless of the number actually responded to correctly. Speed on the task was, therefore, assessed without the variable of accuracy. As illustrated in the ANOVA source table (Table 2, Appendix A), no statistical differences could be identified between groups, and, indeed, no differences within groups (pretest to posttest) were noted. Percentage increases calculated from ratios of the number correct to number attempted on the posttests did not appear indicative of significant change. Thus, there appears to be no different effect on task outcome by number attempted as compared to number gotten correct by treatment subjects.

Limitations of the Study

Perhaps one of the primary limitations of this research study is the small sample size. Although all treatment subjects appear representative of typical T.M.H. student populations throughout the State of Florida by virtue of their meeting IQ and adaptive behavior requirements for placement into Hillcrest School (a facility serving primarily the T.M.H. exceptionality), the sample size may have had an effect on the adequate randomization of the subjects into the three experimental groups.

During the analysis of the results, it was also noted that the mean chronological age of subjects in Group 1 (176 months) was somewhat lower than the mean chronological ages in Groups 2 and 3 (195 months and 193 months, respectively). This observation in conjunction with the obtained correlations found between the pretests and posttests (number gotten correct) and chronological age (*r* = .358 and *r* = .385) suggests the possibility of group differences in chronological age that could may have affected performance outcome.

Another possible limitation was the schedule of treatment employment in Groups 2 and 3. Edenfield (1979) administered treatment approximately one session per week while this researcher employed two treatments in one week and the remaining three in the following week which could have facilitated an imagery treatment "satiation" for treatment subjects.

Recommendations for Further Research

Performance target behaviors other than "numeral naming" may provide further information regarding the possible efficacy of covert positive reinforcement in the academic milieu with T.M.H. students. Prior to employment of covert conditioning, "imagery training" might prove facilitative of the reinforcement procedure. The importance of such training was emphasized by Bender (1977).

Administration of the covert positive reinforcement procedure with T.M.H. students might prove more effective on an individual basis rather than in a small group setting as done in the presenting study. It should be noted that group administration of imagery procedures does deviate from Cautela's (1970) usual technique of covert reinforcement. More "individualized attention" might be advantageous with retarded populations because of possible distractability and tendency toward "off-task" behavior that may occur during group administrations.

Conclusions and Implications for Education

The results of the research study did not demonstrate a significant effect of covert positive reinforcement conditioning with regard to increased accuracy and speed on the numeral naming task by T.M.H. subjects. No advantage of enhanced over nonenhanced covert reinforcement was found via the statistical analyses employed. A significant change between pretest measures of performance and posttest measures was identified in the treatment group incorporating nonenhanced covert positive reinforcement. The findings of the research do not fully support the facilitative advantages of employing covert positive reinforcement conditioning techniques with T.M.H. students on the academic task of numeral naming.

However, there may be implications for advantageous teaching techniques with the mentally handicapped. It is important to note that all of the T.M.H. subjects seemed overtly able to participate in activities designed to encourage directed positive imagery. Although the results of this experiment do not conclusively demonstrate that the use of covert positive reinforcement procedures can necessarily change a specific academic behavior in T.M.H. students, the possibility that imaginal experience can be advantageously directed by a teacher or therapist in such individuals should not be totally abandoned.

This researcher subjectively observed overt qualitative changes in the behavior of many of the experimental subjects during treatment. Several subjects were observed to swallow frequently during food reinforcer segments of the treatment tapes, suggesting salivation. Some made hand and mouth gestures that seemed to mimic the act of eating. Still other subjects verbally told the experimenter that they felt "relaxed" after treatment sessions. The majority of the subjects appeared happy and enthusiastic about attending treatment. It could be speculated that the subjects were positively attracted to their imaginal experiences during the sessions, although novelty effect of the experimental activities and/or the attention given to them by the experimenter might also explain these presenting behaviors.

The educational implication that covert positive reinforcement conditioning techniques are not effective with regard to changing a particular academic behavior in T.M.H. students does not preclude the possibility that similar imagery procedures could be used to condition other types of academic and affective functioning. Further empirical investigation utilizing covert positive reinforcement with individuals of this intellectual level is recommended.

APPENDICES

APPENDIX A

RESULTS OF ANOVA FOR NUMBER ATTEMPTED

Source	df	SS	MS	F
Between Subjects	42			
Group Membership	2	649.08	324.54	1.37
Error	40	9503.22	237.58	
Within Subjects	43			
Pre- Posttest (Attempted)	1	174.14	174.14	7.56*
Group X Pre- Posttest	2	17.32	8.66	.38
Error	40	921.49	23.04	
Total	85			

* $p < .05$

APPENDIX B

INSTRUCTIONS FOR THE FAVORITE FOODS REINFORCER SURVEY

I am going to name five foods that many people enjoy eating. After I name them, I will ask you which of the foods that you like the most in order. I'll write down what you say. For example, if you like ice cream more than the other foods that I say, you say "ice cream" first. If you like candy bars more than the others but not as much as ice cream, say "candy bars" next.

These are the foods: cake, ice cream, cold drinks (like soda pop or fruit drink), cookies, and candy bars. Which of these do you like the best or the most? (Subject responds). Which do you like best next? (Subject responds). Which do you like best next? (Subject responds). Which do you like best next? (Subject responds). And which do you like best next? (Subject responds).

Are there any of these that you don't like or any that you hate? (Subject responds).

(The experimenter may sometimes repeat the names of the foods to the subjects when necessary).

APPENDIX C

SUBJECT ______________________

REINFORCER SURVEY

CAKE	_______
ICE CREAM	_______
COLD DRINKS	_______
COOKIES	_______
CANDY BARS	_______

ANY OF THE ABOVE THAT THE SUBJECT DISLIKES OR HATES?

____

APPENDIX D

INSTRUCTIONS FOR PRETEST AND POSTTEST

I am going to show you some numbers on this viewing screen. Say them out loud to me as fast as you can. Try to get them just right. It is OK to guess or say "I don't know" if you don't know the name of the number. Remember to say them fast, as fast as you can. Get them right as best you can.

Do you have any questions? (Allow subject to respond and explain the instructions again if necessary.)

Are you ready? (Subject responds.) Now, let's begin.

(The numbers are shown on the screen for 150 seconds.)

APPENDIX E

RELAXATION ACTIVITY A

This activity is going to be fun and will help you relax. Listen and follow my instructions.

Sit in your chair as comfortably as you can. Let your arms hang loose by your side. (5 second pause). Good. Now very gently close your eyes. Try not to squeeze them. (5 second pause). Perfect. Slowly breath in deeply a few times. (5 second pause). That's good. Now slowly take in a deep breath and hold it. (5 second duration). Good. Now let it out. (5 second pause).

You're doing a good job and are becoming more relaxed. Now try and do exactly what I say. Try to tighten up every muscle in your body, in your hands, your legs, your stomach, your neck, feet everything. Go ahead. (5 second pause). Good! Keep them really tight until I say "stop". (5 second duration). Good! Now, stop! (5 second pause). Relax! Very good. (5 second pause). Feel how good it is to loosen up your muscles, now. Think to yourself how good it feels. (5 second pause). Good.

Now let's try something different. Keep your arms loose by your side. Let them hang down. Pretend that in each hand, you're holding a rubber ball. It feels soft. You know what rubber balls look like and how they feel. Imagine that you can look down and see them in your hands. When I say "squeeze", squeeze both balls as hard as you can. Ready? Now, squeeze! Squeeze really hard. Keep squeezing. (5 second duration). Very good! Now stop squeezing. Relax. Good job! (5 second pause). Breath normally. Every time that you breath out, you feel good and relaxed. (5 second pause).

For a few seconds be as quiet and as relaxed as you can. (10 seconds duration). Perfect!

Now keep your eyes closed and I will tell you what else we're going to do. (5 second duration).

APPENDIX F

RELAXATION ACTIVITY B

This activity is going to be fun and will help you relax. Listen and follow my instructions.

Sit in your chair as comfortably as you can. Let your arms hang loose by your side. (5 second pause). Good. Now very gently close your eyes. Try not to squeeze them. (5 second pause). Perfect. Slowly breathe in deeply a few times. (5 second pause). That's good. Now slowly take in a deep breath and hold it. (5 second duration). Good. Now let it out. (5 second pause).

You're doing a good job and are becoming more relaxed. Now try and do exactly what I say. Try to tighten up every muscle in your body, in your hands, your legs, your stomach, your neck, feet everything. Go ahead. (5 second pause). Good! Keep them really tight until I say "stop". (5 second duration). Good! Now, stop! (5 second pause). Relax! Very good. (5 second pause). Feel how good it is to loosen up your muscles, now. Think to yourself how good it feels. (5 second pause). Good.

Now let's try something different. Pretend that you are not wearing your shoes or socks. You feel very good because your feet are on some pretty, soft, green grass. (5 second pause). It's warm outside and the sun feels very good. (5 second pause). Now squish your toes into the grass. You feel the soft grass when you squish. (5 second duration). Squish your toes really hard. Now squish! (5 second duration). Now relax your toes. Good.

For a few seconds be as quiet and as relaxed as you can. (10 seconds duration). Perfect!

Now keep your eyes closed and I will tell you what else we're going to do. (5 second duration).

APPENDIX G

ACADEMIC ACTIVITY SCRIPT

Pretend that you are looking at a small television that is turned off. (5 second pause). The television is now turned on and a big number "one" appears. (5 second pause). You know what this number is and say it out loud as fast as you can. (5 second pause). You feel happy because you know the number and can say it really fast. Another number is shown on the screen. It is the number "three". See the "three" on the screen. You know the number and say it out loud as fast as you can. You feel great and proud because you know the number and say it really fast. (5 second pause). Another number appears on the screen. It is the number "seven". You say it really, really fast. You feel good. (5 second pause). As soon as you say each of the numbers on the screen like "three" or "seven", other numbers are shown to you, one at a time. (5 second pause). You can see the numbers on the television and can see yourself getting them right and saying them fast. (10 second pause). You are naming them fast. (10 second pause). You are very happy because you are naming them quickly and getting them right.

APPENDIX H

REINFORCER SCRIPT FOR ENHANCED COLD DRINK

Keeping your eyes very gently closed, pretend or make-believe that in front of you, you see your most favorite or best kind of cold drink like soda pop or fruit drink. (5 second pause). Pick it up in your hand and look closely to see what kind of cold drink it is. (5 second pause). Look at what kind of glass or bottle it is in. (5 second pause). What color is it? (5 second pause). Now, take a nice smell of your cold drink because it smells so good. (5 second pause). Okay, go ahead and take a nice slow sip of your drink and feel how cold, wet, and good it feels as it touches your tongue. (5 second pause). Taste the flavor of your cold drink as it begins to cool the inside of your mouth. (5 second pause). Now, take another nice slow sip of your cold and good-tasting drink and enjoy the great flavor as it slowly goes down your throat. (5 second pause). It makes you feel great to be enjoying one of your favorite things. (5 second pause). Go ahead and take one more nice slow sip of your cold, good drink. (5 second pause). As your drink cools the inside of your mouth and slowly goes down your throat, you feel very good. (10 second pause). You feel great because the cold drink is so good. (10 second pause).

Before I ask you to open your eyes, you may enjoy another sip of your cold drink and the good feelings that you have. (10 second pause). Hmm, keep sipping your drink. (10 second pause). It tastes wonderful. (10 second pause).

Begin to get ready to slowly open your eyes. (5 second pause).

Okay! Slowly begin to open your eyes. (5 second pause).

Now, open your eyes wide. (5 second pause).

You feel very relaxed and very good and the rest of your day will be a very good day.

APPENDIX I

REINFORCER SCRIPT FOR ENHANCED CAKE

Keeping your eyes very gently closed, pretend or make-believe that in front of you on a plate is a large piece of your most favorite kind of soft, great tasting, delicious cake. Hmm, it looks so good! (5 second pause). Look closely at it to see what kind of cake it is. (5 second pause). Look at what shape it has been cut. (5 second pause). What color is it? (5 second pause). Now, with your fingers, break off a piece of your cake and take a smell of it because it smells so good. (5 second pause). Okay, go ahead and take a nice big bite of your piece of cake and feel how soft and good it is as you bite into it. (5 second pause). Taste the flavor of it in your mouth as you begin to chew it nice and slow. (5 second pause). It feels very soft, and tastes very good and delicious. (5 second pause). Keep enjoying the delicious flavor in your mouth as your bite of cake slowly goes down your throat. (5 second pause). It makes you feel very good to be enjoying one of your favorite things. (5 second pause). As the last bit of delicious cake goes in your mouth and slowly goes down your throat, take a moment to enjoy the good feelings you have. (10 second pause). It feels so good. (10 second pause).

Before I ask you to open your eyes, you may enjoy eating some more of your soft, delicious cake, and the good feelings you have.

(10 second pause). Keep eating. (10 second pause). Hmm, it tastes great! (10 second pause).

Begin to get ready to slowly open your eyes. (5 second pause).

Okay! Slowly begin to open your eyes. (5 second pause).

Now open your eyes wide. (5 second pause).

You feel very relaxed and very good and the rest of the day will be a very good day.

APPENDIX J

REINFORCER SCRIPT FOR ENHANCED CANDY BAR

Keeping your eyes very gently closed, pretend or make-believe that in your hand, you are holding your most favorite kind of sweet, chewy, and best tasting candy bar. (5 second pause). Look at it closely to see what kind of candy bar it is. (5 second pause). Look at how it is shaped. (5 second pause). What color is it? (5 second pause). Now, take a nice smell of your candy bar, because it smells so good. (5 second pause). Okay, go ahead and take a nice big bite of your candy bar, and feel how chewy it is as you bite into it. (5 second pause). Taste the flavor of it in your mouth as you begin to chew it nice and slow. (5 second pause). It feels very chewy and tastes very sweet. (5 second pause). Keep enjoying the sweet and delicious flavor in your mouth as your bite of candy continues to slowly go down your throat. (5 second pause). It makes you feel very good to be enjoying one of your favorite things. (5 second pause). As the last bit of sweet, chewy, and delicious flavor goes in your mouth and slowly slides down your throat, enjoy the good feelings you have. (10 second pause). You feel good. (10 second pause).

Before I ask you to open your eyes, you may enjoy another good tasting bite of your sweet, chewy, and delicious candy bar, and the good feelings you have. (10 second pause). Hmm, keep chewing. (10 second pause). It tastes wonderful! (10 second pause).

Begin to get ready to slowly open your eyes. (5 second pause).

Okay! Slowly begin to open your eyes. (5 second pause).

Now open your eyes wide. (5 second pause).

You feel very relaxed and very good and the rest of your day will be a very good day.

APPENDIX K

REINFORCER SCRIPT FOR ENHANCED COOKIES

Keeping your eyes very gently closed, pretend or make-believe that in front of you, sets a plate of your most favorite kind of chewy and delicious cookies. (5 second pause). Pick-up one of the cookies and look at it closely to see what kind of cookie it is. (5 second pause). Look at how it is shaped. (5 second pause). What color is it? (5 second pause). Now, take a nice smell of your cookies because it smells so good. (5 second pause). Okay, go ahead and take a nice big bite of your cookies, and feel how chewy it is as you bite into it. (5 second pause). Taste the flavor of it in your mouth as you begin to chew it nice and slow. (5 second pause). It feels very chewy, and tastes very good, and delicious. (5 second pause). Keep enjoying the delicious flavor in your mouth as your bite of cookies slowly goes down your throat. (5 second pause). It makes you feel very good to be enjoying one of your favorite things. (5 second pause). As the last bit of chewy and delicious flavor goes in your mouth and slowly goes down your throat, take a moment to enjoy the good feelings you have. (10 second pause). You feel good.

Before I ask you to open your eyes, you may enjoy eating the rest of your chewy, good, and delicious cookie, and the great feelings you have. (10 second pause). Hmm, keep enjoying it! (10 second pause). It tastes great! (10 second pause).

Begin to get ready to slowly open your eyes. (5 second pause).

Okay! Slowly begin to open your eyes. (5 second pause).

Now, open your eyes wide and look around the classroom. (5 second pause).

You feel very relaxed and very good, and the rest of your day will be a very good day.

APPENDIX L

REINFORCER SCRIPT FOR ENHANCED ICE CREAM

Keeping your eyes very gentle closed, pretend or make-believe that in your hand, you are holding an ice cream cone, piled-high with your most favorite kind of soft, cold, and creamy ice cream. (5 second pause). Look closely to see what kind of ice cream it is. (5 second pause). Look at how it is shaped. (5 second pause). What color is it? (5 second pause). Now, take a nice smell of your ice cream because it smells so good. (5 second pause). Okay, go ahead and take a nice big bite of your ice cream and feel how soft and cold it is on your tongue. (5 second pause). Taste the flavor of your ice cream as it slowly melts in your mouth. (5 second pause). It feels very sfot and cold, and tastes very creamy. (5 second pause). Keep enjoying the delicious flavor in your mouth as the ice cream continues to melt, and slowly goes down your throat. (5 second pause). It makes you feel very good to be enjoying one of your favorite things. (5 second pause). As the last bit of soft, cold, and creamy, delicious flavor melts in your mouth, and slowly goes down your throat, enjoy the good feelings you have. (10 second pause). You feel great because the ice cream is so good. (10 second pause).

Before I ask you to open your eyes, you may enjoy another delicious bite of your soft, cold, and creamy ice cream, and the good feelings you have. (10 second pause). Hmm, keep eating your delicious icecream. (10 second pause). It tastes wonderful. (10 second pause).

Begin to get ready to slowly open your eyes. (5 second pause).

Okay! Slowly begin to open your eyes. (5 second pause).

Now, open your eyes wide. (5 second pause).

You feel very relaxed and very good and the rest of your day will be a very good day.

APPENDIX M

REINFORCER SCRIPT FOR NONENHANCED CAKE

Keep your eyes closed and pretend or make-believe that you are eating your most favorite kind of cake. Do this until I say "stop".

(15 second pause). Keep eating. (15 second pause). Keep eating your favorite cake. (15 second pause). Keep eating. (15 second pause). Stop!

Begin to get ready to slowly open your eyes. (5 second pause).

Okay! Slowly begin to open your eyes. (5 second pause).

Now, open your eyes wide. (5 second pause).

You feel very relaxed and very good, and the rest of your day will be a very good day.

APPENDIX N

REINFORCER SCRIPT FOR NONENHANCED ICE CREAM

Keep your eyes closed and pretend or make-believe that you are eating your most favorite kind of ice cream. Do this until I say "stop".

(15 second pause). Keep eating. (15 second pause). Keep eating your favorite ice cream. (15 second pause). Keep eating. (15 second pause). Stop!

Begin to get ready to slowly open your eyes. (5 second pause).

Okay! Slowly begin to open your eyes. (5 second pause).

Now, open your eyes wide. (5 second pause).

You feel very relaxed and very good, and the rest of your day will be a very good day.

APPENDIX O

REINFORCER SCRIPT FOR NONENHANCED CANDY BAR

Keep your eyes closed and pretend or make-believe that you are eating your most favorite kind of candy bar. Do this until I say "stop".

(15 second pause). Keep eating. (15 second pause). Keep eating your favorite candy bar. (15 second pause). Keep eating. (15 second pause). Stop!

Begin to get ready to slowly open your eyes. (5 second pause).

Now open your eyes wide. (5 second pause).

You feel very relaxed and very good, and the rest of your day will be a very good day.

APPENDIX P

REINFORCER SCRIPT FOR NONENHANCED COLD DRINKS

Keep your eyes closed and pretend or make-believe that you are drinking your favorite kind of cold drink like sodapop or fruit-drink. Do this until I say "stop".

(15 second pause). Keep drinking. (15 second pause). Keep drinking your favorite cold drink. (15 second pause). Keep drinking. (15 second pause). Stop!

Begin to get ready to slowly open your eyes. (5 second pause).

Now open your eyes wide. (5 second pause).

You feel very relaxed and very good, and the rest of the day will be a very good day.

APPENDIX Q

REINFORCER SCRIPT FOR NONENHANCED COOKIES

Keep your eyes closed and pretend or make-believe that you are eating your most favorite kind of cookies. Do this until I say "stop".

(15 second pause). Keep eating. (15 second pause). Keep eating your favorite cookies. (15 second pause). Keep eating. (15 second pause). Stop!

Begin to get ready to slowly open your eyes. (5 second pause).

Okay! Slowly begin to open your eyes. (5 second pause).

Now, open your eyes wide. (5 second pause).

You feel very relaxed and very good, and the rest of your day will be a very good day.

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BIOGRAPHICAL SKETCH

Bruce Alan Hartley was born January 24, 1952 in Carbondale, Illinois. He has lived in the State of Florida since the age of 10. His parents, Mr. and Mrs. Earl Hartley, presently reside in St. Petersburg, Florida.

Bruce gained early admission into Central Florida Community College and earned the Associate of Arts degree in May, 1971. He attended the University of Florida, majoring in psychology, and received his Bachelor of Science degree on June 9, 1973. From August, 1973 to August, 1975, Bruce studied clinical psychology at Eastern Kentucky University and was awarded the Master of Science degree.

He subsequently returned to Florida and took a position as an alcohol counselor at the Comprehensive Alcohol Rehabilitation Program, a division of the Marion-Citrus Mental Health Centers in Ocala. During his two year tenure of employment at the mental health center, Bruce was also supervisor of the Substance Abuse Unit, and later worked as a staff psychologist in the main clinical outpatient division. Bruce fell in love with his beautiful secretary, the former Ms. Teresa Smith, and they were married on July 8, 1978.

Since October, 1977, Bruce has been employed as a school psychologist with the Marion County School System. He is certified and licensed as a school psychologist in the state of Florida.

He entered the doctoral program in Foundations of Education at the University of Florida in 1980. He plans to complete the requirements for his Doctor of Philosophy degree in December, 1983.

At the present time, Bruce resides with his gorgeous wife, his lovely 10 year-old daughter, Jennifer, and active 2 year-old son, Adam Patrick, in an old, but colorful two-story dwelling in Ocala. The nuclear family also includes a Boston Terrier, a small pet bird, and a crazy hound dog named Buddy.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Donald L. Avila

Dr. Donald L. Avila, Chairperson
Professor of Foundations of Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Barry J Guinagh

Dr. Barry Guinagh
Associate Professor of Foundations of Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Janet L. Larsen

Dr. Janet Larsen
Professor of Counselor Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Robert E. Jester

Dr. Robert Jester
Associate Professor of Foundations of Education

This dissertation was submitted to the Graduate Faculty of the Department of Foundations of Education in the College of Education and to the Graduate School, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

December 1983

James Alguire

Chairman, Foundations of Education

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